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Educative/Psychotherapeutic Rehabilitation Groups Following Myocardial Infarction: A Study of Denial and Depression in the Post Infarct Patient

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EDUCATIVE/PSYCHOTHERAPEUTIC REHABILITATION
GROUPS FOLLOWING MYOCARDIAL INFARCTION: A STUDY
OF DENIAL AND DEPRESSION IN THE POST INFARCT
PATIENT

by

Lynn Dee Feldman Lindgren

A Dissertation Submitted to the Faculty of the
Graduate School of Loyola University of Chicago
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy

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VITA

The author, Lynn Dee Feldman Lindgren, is the daughter of William Feldman and Fredrika (Rosenkrantz) Feldman. She was born June 13, 1946 in Chicago, Illinois.

Her elementary and secondary education was obtained in the public schools of Highland Park, Illinois, where she graduated from Highland Park High School in 1964.

In September, 1964, she entered the University of Michigan, and in December, 1967, received the degree of Bachelor of Science with majors in special education for the emotionally disturbed and the social sciences. While attending the University of Michigan she was active in the Tutorial Project for the Disadvantaged. In 1967 she was awarded a scholarship by the State of Michigan.

In June, 1974, she received the Master of Education degree at Loyola University of Chicago, and was certified as a school psychologist in June, 1975. In 1976 she served as a school psychologist in Evanston, Illinois. In 1977 she was granted an assistantship in Educational Psychology at Loyola University of Chicago. She is presently employed as a psychologist by the Northern Suburban Special Education District.

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INTRODUCTION

Heart Disease is the number one illness in the United States, killing over 950,000 each year. Individuals who have undergone the physical and psychological trauma of a myocardial infarction experience a devastating life-threat. The mechanisms with which the individual copes are varied and often counterproductive to his rehabilitation following the illness. Both depression and denial are widely hypothesized to be common patterns of patient response which inhibit recovery. Depression, following a physical trauma such as a myocardial infarction, is a common occurrence which may be due to many causes such as fear of death, change in locus of control due to hospitalization, and preparations to change a current lifestyle. Denial (i.e. refusing to acknowledge the existence of a myocardial infarction and not to follow a doctor's orders) might severely inhibit the healing process and be detrimental to the patient's health status.

The present study examines an educative treatment program intended to be a helpful and healthful addition to a successful convalescence, and to promote the prolonged

longevity of the cardiac patient. Individuals who have sustained an infarct are presumed to need to have the opportunity to share their fears and anxieties with others in the same situation and to be educated about their illness. In-patient group rehabilitation therapy following an infarct is intended to provide the patient with an understanding and educative milieu in which he can learn more about his disease and his feelings regarding it. It is presumed that the patient must first learn to accept the reality of the disease before he can devise the means of a healthful adjustment to it. The present investigation tests the following hypotheses: 1. Denial and depression are inversely correlated in patients who have sustained a myocardial infarction. 2. Post-infarct patients who go through an educating and counseling experience, such as coronary rehabilitation classes, will have lower levels of both depression and denial. 3. There is a curvilinear relationship between depression and time. It was expected that the curve would be depicted by the higher levels of depression being at the first and third interviews, and the lowest level at the second interview, indicating an increase in depression both following the infarct and post-discharge.

The traditional role of education has been to explain, demonstrate, and inform. These same goals may be accomplished within other confines than the school walls and with any age of individual. Cardiac rehabilitation groups

aim to fulfill these objectives of education while providing the patient with a sense of control over his life. As in schools and institutions where the psychological aspects of learning and increasing motivation are being implemented, so must knowledge of educational psychology be applied to medical populations. Olbrisch (1977) summarized current research in which psychotherapy was implemented to help treat physical illness. Psycho-educational therapy goals of reducing anxiety, assisting in following treatment programs and increasing acceptance of the illness and its ramifications are highlighted in this study. Medical practitioners and psychologists have begun to cooperate in treating physical illnesses.

REVIEW OF THE RELATED LITERATURE

History of Psychosomatic Approach to Illness

General Assumptions. Alexander and Flagg's excellent historical summary of the psychosomatic approach (in Wolman, 1965) denotes that the first attempts made by the Greeks to explain natural events from natural causes occurred in the seventh and sixth centuries, B.C. The cosmological philosophers' rationalistic approach was applied to the biological by Hippocrates and his followers. Mental disease was then thought to be the result of physical illness. Psychology became the province of the philosophers and developed as a rational approach by Socrates, Plato and Aristotle. The main tenet of Plato and Aristotle was that the mind rules over the body. However, the Romans believed that the physician dealt with an indivisible human being and, thus, were concerned with making the whole patient comfortable. Cicero's belief that bodily ailments may be related to emotional factors resulted in the birth of psychosomatic medicine.

Although demonology was the basic explanation for psychosomatic disorders for centuries, eighteenth century physicians and scientists considered it only a matter of

time before the mental and physical diseases of the body would be understood on the basis of anatomy, physics, and chemistry.

The term, "psychosomatic," was used by the German psychiatrist, Heinroth, to refer to somatic effects of psychological conflict in the early 1800's. At the end of the nineteenth century, Charcot experimentally demonstrated the influence of ideas upon bodily disturbances in hysteria. Following Charcot, Freud's work created a rift in psychiatry between the psychological and the organic orientations. The current psychosomatic approach appears to be an effort to find common ground between these two orientations.

Applications in Cardiovascular Disease. The general populace, as well as clinicians, has long assumed an etiological relationship between stress, especially suppressed anger, and heart disease. However, studies investigating this phenomenon were not conducted until the middle 1940's. Gildea (1949) found, in evidence gathered from psychiatric interviews, that certain patterns of personality malfunction are common to specific psychosomatic disorders. Some of the conditions considered were ulcerative colitis, hypertension, coronary diseases, and bronchial asthma. He also found that patients with coronary disease respond with an arrest of symptoms relatively frequently to a variety of guidance and authoritarian modes of therapy.

Cleveland and Johnson (1962) studied twenty-five males hospitalized for recent myocardial infarction as compared with similar data on twenty-five males awaiting serious surgery. It was discovered by means of psychological tests that both presurgery and post-infarct patients reflected special anxiety regarding imminent death and physical incapacity. In addition, post-coronary patients revealed a pattern of restlessness, underlying passivity and suppressed hostility which the author thought may have some bearing on their propensity for coronary disease.

Chambers and Reiser (1953) reported the effect of emotional stress on twenty-five patients and established that 76 percent of the cases of cardiac decompensation were precipitated by emotional tension. Likewise, Mainhardt and Robinson (1962) reported that the incidence of Stokes-Adams Syndrome (a condition which frequently accompanies heart block) correlated significantly with the patient's unsatisfied dependency strivings and precipitation of his complete heart block.

Adsett's et. al. (1962) study of coronary blood flow established psychophysiological correlations between intentionally stressful interviews and coronary blood flow, blood pressure, pulse rate, and cardiac output. Anxiety and anger also were found to increase the rate of the flow of blood.

Theoretical Assumptions Underlying Psychological Treatment of Psychosomatic Problems

Psychoanalytic Treatments. It is Freud's (1954) basic theory that if one can arrange a special set of conditions and have the patient talk about his difficulties in certain ways, then behavioral changes can be effected in behaviors which appear to be inaccessible to change by any other method. It has been used to treat patients with psychosomatic disorders. As a treatment choice, Fine (in Corsini, 1973) states that it is effective on a short-term basis to confront dependency needs and then terminate therapy during positive transference.

Behavioral Treatments. Goldstein (in Corsini 1973) defines neurotic behavior as, ". . . any persistent habit of unadaptive behavior either acquired by learning or as an unlearned response occurring in situations which are the result of unadaptive learned behavior in a physiologically normal organism." The author purports that this statement takes into account psychosomatic behaviors. Behavior therapy for patients suffering from these disorders can take the form of unearthing the patient's behavioral repertoire and through role play, desensitization and assertiveness training, develop better adaptive behaviors.

Encounter Therapy Groups. The main purpose of encounter, Schutz (Corsini, 1973) states is to help an individual become more aware of himself. The patient must join the group

voluntarily, thus assuming responsibility for his actions. The group format concerns itself with relations among people, and deals with openness and honesty to avoid self-deception. Encounter theorists believe that emotional trauma can alter the course of physical development, i.e. psychosomatic disorders, and that body tensions weaken organs, making them more vulnerable to disease. Thus, encounter groups can either supplement more traditional therapy or be used as the sole method.

Experimental Bases of Contemporary Approaches to Treatment
Western Electric Study. The University of Illinois' Western Electric study, conducted for five years, was established to distinguish between the characteristics of a male population believed to be free of clinical coronary heart disease and men developing the disease during the course of the study. In a fallout study, Lebovitz (1967) found a significant difference between the two groups with regard to those developing heart disease showing the factors of elevated blood pressure, elevated blood cholesterol, ST and T-wave abnormalities, and the excessive use of coffee and cigarettes.

The strength of these studies lies in the longitudinal, long-term aspects of the experiment, thus allowing real change to occur when possible.

Type A/B Personalities. Recent research on heart disease is accumulating evidence that psychological factors and life

styles have an important involvement in the etiology of this disability. Rosenman's "Type A" (Jenkins, 1971) coronary behavior has been related to increase in coronary heart disease in research studies since the late 1960's. This pattern can be characterized by "extremes of competitiveness, striving for achievement, aggressiveness (although sometimes stringently repressed), haste, impatience, restlessness, hyper-alertness, explosiveness of speech, tenseness of facial musculature and feelings of being under the pressure of time and the challenge of responsibility. Persons with this pattern are usually deeply committed to their job or profession and often have achieved success in it." Lebovitz (1974) attempted to refute the Rosenman hypothesis by contending that there exists more than a bipolarity between "A-ness and B-ness," and examined the problems of personality dimensions with regard to response sets and the question of whether personality itself can be treated as a significant risk factor for coronary heart disease in its own right. His MMPI study was able to distinguish factor loadings that underlie the three groups (non-coronary, myocardial-sudden death, angina pectoris). It was discovered that there was an absence of overlap between the psychological variables measured by the MMPI, and the physiological variables of blood pressure, cholesterol and smoking in the non-coronary group. However, this overlap was present in both the angina and the MI groups. Thus it was found by a large number of

factors present for each group, that the Type A pattern should be subdivided, and other patterns could possibly be added. The study did reiterate many previous ones by again showing that individuals of some specific personality patterns have a greater proness for acquiring coronary heart disease when their physiological measures are equalled with non-coronary individuals.

Sisyphus Reaction. Bruhn et. al. (1963) in their study of the "Sisyphus reaction" added yet another dimension to the "Type A" personality and prediction of survival. The Sisyphus pattern is characterized by "an effort-oriented person who strives against odds, but with very little sense of accomplishment or satisfaction." The authors, using a combination of psychiatric interviews, Friedman-Rosenman's Type A interview, and the MMPI D-scale, were able to isolate patient from healthy controls and correctly predict sudden death or myocardial reinfarction in seven out of nine patients. These findings indicate that the Sisyphus reaction was as correct in isolating coronary heart disease patients as the Type A interview. Since the loading of these factors had prognostic significance for survival, the research suggests that further investigation of prophylactic techniques is advisable.

Additional Studies. Many of the studies mentioned used angina pectoralis patients as one of the groups isolated in the coronary research. Ostfeld et. al. (1964) emphasizes

in his study the importance of maintaining the division between these and the MI patients, since the angina patients showed a greater tendency toward hypochondriasis, emotional lability and suggestability, and greater fluctuations in cardiovascular functioning than the MI patients and healthy controls. The evidence further substantiated that patterns of behavior are significant in the epidemiology of coronary heart disease, although a significant difference between infarct and non-coronary groups was not found on the MMPI scores.

A study by Caffrey (1968) discusses reliability and validity assessments of some personality and behavioral measure obtained in a study of Benedictine and Trappist monks. The atmosphere of the monasteries as well as the personalities of monks and priests were evaluated according to "Type A" patterns. It was found that the type A atmosphere combined with the Type A personality variables produced a higher rate of myocardial infarction in the religious population. Those monks and priests whose lives the most closely approximated the pace that is typically American tend to have the rate of heart disease that is also typically American.

Depression and Denial: Some Common Factors

Depression Defined. Wittenborn (in Wolman, 1965) defines the depressive reaction as anxiety that is allayed and partially relieved by depression and self-depreciation. The reaction

is precipitated by a current situation, frequently by some loss sustained by the patient, and is often associated with a feeling of guilt for past failures or deeds. The degree of reaction in such cases is dependent upon the intensity of the patient's ambivalent feeling toward his loss (love, possession) as well as upon the realistic circumstances of the loss.

The term is synonymous with "reactive depression" and is to be differentiated from the corresponding psychotic reaction. In this differentiation, points to be considered are (1) life history of patient with special reference to mood swings (suggestive of psychotic reactions), personality structure (neurotic or cyclothymic) and precipitating environmental factors and (2) absence of malignant symptoms (hypochondriacal preoccupation, agitations, delusions, particularly somatic, hallucinations, severe guilt feelings, intractable insomnia, suicidal ruminations, severe psychomotor retardation, profound retardation of thought, or stupor).

Akiskal (1975) in his comprehensive review of the literature on depression succinctly describes the current findings in this area. The studies described relate depression to physiological variables and how it is often associated with negative improvements in individual psychotherapy.

Studies Relating to Depression in Myocardial Infarction.

When the body is in a stressful situation, there is increased sympathetic system activity. Central nervous system arousal increases catecholamine excretion such as epinephrine and norepinephrine. Since norepinephrine increase has been related to aggressive, hostile coping mechanisms and increased epinephrine levels are related to passive, uncertain or anxious responses, a relationship between these behaviors and catecholamine levels was hypothesized by Klein, Garity and Gelein (1974). Their study used daily checklists of patients in the coronary care unit which included norepinephrine/epinephrine urinary outputs, daily physiological data and behavioral inventory. The results showed a positive and significant relationship between hostility, depression and epinephrine excretion. There was no significance found between norepinephrine excretion and expression-repression dimensions in this study. The authors referred to the patients as "adjusting to," "coping with" the anxieties associated with an infarct when they displayed a reduction in distress and increase of positive feelings. (This reviewer sees this as an instance of denial, which was not covered in the study).

Bruhn (1969) using the MMPI as a pre and post measurement, and psychological and physical indices over a seven-year time span, discovered that patients who died during the period scored significantly higher on the de-

pression subscale at the time of entry. Like the Shekelle and Lebovits study, the non-survivors had higher scores on Hy, Pd, and Pt scales than survivors. It was suggested that depression may be an important indicator of the approaching demise of the patient. Physiological changes were not positively correlated with depression.

Naditch, Gargan and Michael (1975) found that the use of denial as a defense mechanism may have a high degree of interaction with depression. Denial and depression were negatively correlated, and in their multiple regression procedure, had both significant and main effects when considered with anxiety, locus of control, and discontent. The authors also found support for the observation that depression may be the result of the inability to effectively deny when faced with a threatening situation. Their main findings were consistent with their hypothesis that depression and anxiety can be associated with a belief in external control and are positively correlated.

Rosen (1966) agrees with the previous studies that state that the most frequent reactions to heart disease are anxiety, depression and denial of the illness. The patients referred to either failed to comply to the prescribed medical regimen, or over-reacted and over-protected themselves. Depressive symptoms were evident as loss in self-esteem, but not seen as death wishes or irritability. The hypothesis that age is an important variable in the psycholog-

ical reaction of male patients to an MI was supported by results on interviews rating depression, denial and anxiety. The patient group showing significantly higher scores in all dimensions was composed of men from 50-59 years of age. The author drew an analogy between this period of life and that of adolescence to support the belief that "...men still cling to achievement-autonomy goals, feeling they must push on; yet have begun to doubt their ability to reach these goals, and while some are no longer certain that the rewards of striving are so desirable, they are reluctant to retreat from the struggle." Thus, the heart attack confronts the self-esteem of a man in his 50's most severely and renders him depressed.

Kavanagh and Shephard (1975) support Rosen's findings and expand them to describe data suggesting a bimodal distribution of patients. One group had a "normal" score on the MMPI apart from a tendency to hypomania. The other had severe depression with associated hysteria, hypochondriasis and psychasthenia. The severely depressed patients were older with a greater tendency toward hypertension and angina. The authors feel that the two types of patients require opposite approaches to therapy by the rehabilitation team: the normal, hypomanic needs restraint whereas the depressed individual needs encouragement. Of the two groups, the depressed patients benefited most from psychotherapy.

Denial Defined. Neff and Weiss (1955) define denial as a very primitive psychodynamic mechanism in comparison with other defenses. They found that patients who verbally denied their disability explicitly had, premorbidly, regarded ill health as an imperfection, weakness or disgrace. They continue to state that denial operates in what they call a "hedonic system or belief" where what gives relief or satisfaction is "true" and what causes unhappiness is "false." Denial can also operate as a neurotic mechanism, an ego-protective device for non-brain-damaged people.

Studies Relating to Denial in Myocardial Infarction Patients

Croog (1971) in his often-referred to study on denial in male infarct patients, could not dispute the hypothesis suggested by others that the "tendency toward denial is a general characteristic of heart patients." Findings in Croog's study associated denial with the ethnic backgrounds of both Jewish and Italian patients. He also made the suggestion that, although deniers reported being more often depressed than nondeniers, their depression was less severe. Patients displaying denial may disregard significant symptoms that would hinder medical care and rehabilitation. Although he characterizes denial as a means of coping, he suggests that it can be fatal for the heart patient if used to extreme.

Hackett and Cassem (in Abrams, 1970) first defined denial as "the conscious and unconscious repudiation of all or a

portion of the total available meaning of an illness in order to allay anxiety to minimize emotional stress." In their study of MI patients attached to an audible-beep monitor-pacemaker, they discovered that the patients presented their defense in three distinct patterns. They use the term "major denial" to describe those patients who stated "unequivocally and unremittingly that they experienced no anxiety as a result of their illness, or during their time on the monitor-pacemaker." The term "partial denial" was applied to patients who denied initially their fears concerning the infarct and supporting apparatus, but who eventually admitted concern about the illness. "Minimal deniers" were those who may not complain of anxiety, but would admit to it when questioned specifically. The authors discovered that social-economic status did not have an effect on the manner in which patients responded to an MI. Both categories of blue and white collar workers tended to deny to the same extent. There were more major deniers among blue collar workers, and no minimal deniers among white collar workers. Previous MI had no effect on extent of denial used. Hackett and Cassem found that denial was effective (although this is not explained), and had a role in fending off depression.

Bishop (1973) presents the theory that the physician is the most important person in the physical rehabilitation of the patient. Because of this fact, he emphasizes the

importance of the physician's emotional stability to counteract the emotional liability of the recent MI patient. He further describes the usual pattern of denial and depression that he witnessed in his coronary patients. Along these lines, Ostfeld, Lebovits, and Shekelle (1964) mention that the infarct group they studied "complained about their health even less than is usual within the non-coronary group." Rather than an index of adjustment, it appears to be an index of denial. Wrzesniewski (1975) found in his study of male, white-collar workers at a rehabilitation sanatorium following myocardial infarct, that the attitude favoring the rehabilitation process was a "high level of acceptance of the diagnosis and medical recommendations; optimistic expectations as to the future; low level of care-demanding attitude; and an even-tempered mood." The attitude found to most impede rehabilitation was a lack of acceptance of medical diagnosis and recommendations combined with either depressed or manic-unrealistic optimism.

Greene, Moss and Goldstein (1971) in their study concerning denial in coronary heart disease state that the term and concept of denial is overused and often abused when describing patients' reactions. He hypothesizes that rather than using the defense mechanism of denial, these patients are either repressing into the unconscious or suppressing into the preconscious the likelihood that they have heart attack symptoms. These mechanisms of ignoring

the thought may be quite conscious and "reinforced by rationalizations, displacements, magical thinking, isolation and undoing or reaction formation...these reactions are not as acutely evasive as denial." On the other hand, Hackett and Cassem (1969) see the infarct patient using denial at the three levels based on the patient's expression of anxiety when hospitalized. Olin and Hackett (1964) also noted denial in MI patients when fear of death was not expressed by 31 out of 32 of the men in the study.

Gentry, Foster and Haney (1972) using Hackett and Cassem's major, partial and minimal denier classifications in their study of heart patients, found that the defense mechanism of denial appeared to be a major determinant of the anxiety level of each patient. The "deniers" reported less anxiety than a normal, unstressed individual, and also reported to notice no change in their health status prior to hospitalization and while in the coronary care unit. The degree of depression reported by the patients themselves remained fixed over time. The level was described as being midway between that found in normal non-depressed individuals and severely depressed psychiatric patients. Therefore, while depression is common among post MI patients, it is rarely so severe as to warrant antidepressive medications. The authors noted that of the two patients who expired after the study, one had reported levels of depression equal to that of hospitalized depressive reaction patients.

Levine and Zigler (1975) found that hospitalized lung cancer and heart disease patients all evidenced some degree of denial when they responded to a questionnaire as not being any more dissatisfied with their present level of functioning than did healthy controls. They denied having higher aspirations rather than their real level of functioning. Among their patient groups, the stroke patients employed denial more successfully than the lung cancer patients, and both more than the heart disease patients.

Froese (1974) studied denial in myocardial infarction patients using the Hackett-Cassem Denial Scale (1974). He discovered that these individuals could be classified as either deniers or non-deniers. Those who typically use denial as a defense maintained a higher level of denial after the original threat had vanished. This person did not need anxiety in order to deny as the non-denier did. Depression was found to drop midway through hospitalization for the deniers only. Denial returned to the admission level for both groups just prior to discharge.

Doehrman's comprehensive review (1977) describes the three categories which affect a MI patient's recovery and rehabilitation process. These subdivisions are advocacy (non-scientific emotional reactions, counseling), clinical (impressionistic observations of emotional states of patients and family members) and empirical (scientific examination of some issues regarding the social-psychological

functioning of the patients). Doehrman concludes that about one-half of the patients studied reached the hospital within three hours after the onset of symptoms, that there is no adequate evidence to prove that intensive care unit(ICU) procedures cause short-term or long-term emotional disturbance for the patients, that depression generally does not occur during the first two weeks, that emotional distress of most MI patients reaches a peak after hospital discharge during convalescence, and many psychological and social counseling programs probably reduce the emotional distress to patient and family that is caused by acute coronary heart disease.

Current Trends in Treatment

Trends as Reported in the Literature. Ohlmeier, Karstens, and Kohle (1973) describe the use of group-analytic methods with infarct patients. The authors used the-group-as-a-whole approach to interact with the therapist. Various defenses (rationalization, denial, identification with the aggressor) were utilized to combat the deep fear of loss of identity. The authors found that it was difficult to distinguish between the "myocardial infarction personality, and the post-myocardial psychic reactions to the illness."

Heffron (1974) found that group therapy with chronic diseases afforded the patients the opportunity to share problems and relieve anxieties. The author sees the physician as taking the role of therapist and establishing group goals. The therapist should remain in the background and

allow the group to develop and interact. Felton and Swinger (1973) agree with the methodology, and emphasize the importance of the "here and now" situation of a group. The authors found that the group encourages its members to express problems, feelings, and attitudes they may have kept hidden privately with the therapist. As the patients relate to one another, they are able to learn more about themselves and can generalize new learned behaviors to the outside world.

Rosen (1975) supports this view on the effectiveness of using group therapy with chronic diseases. He adds that the patients benefited from the opportunity to express themselves and to change their attitudes about their illness toward a more realistic appraisal. Dudley et. al. (1969) in their study on chronically ill patients with irreversible diffuse obstructive pulmonary syndrome (DOPS) found that these patients typically used the defense mechanisms of denial, repression and isolation in order to survive. Dudley et. al. (1969) infer that physicians see these defenses as a means of protection from dangerous symptoms and behaviors. This means of adaption decreased the depression response in the face of a life change. (This was surmised, but not tested). The patients were asked to participate in group therapy, those patients who dropped out have more acute symptoms and fewer psychosocial assets. In the group, many strong emotional reactions were ventilated that evidenced the

decreased use of denial through the group process.

Rahe et. al. (1975) found that group therapy sessions did educate the infarct patient as to the management and nature of his disease. The study also found that the greater the medical understanding of the disease, the greater the motivation to join a physical fitness program, and to understand the psychological factors related to the infarct. Pozen et. al. (1977) in their study of nurse rehabilitator found that educating and counseling the patient increased the return to work rate and decreased smoking.

Ibrahim (1974) also discovered that members of a psychotherapy group following myocardial infarction exhibited "less social alienation, shorter hospital stays and a favorable attitude toward group psychotherapy." The author mentions "survival experience" but does not specifically discuss if increased survival rates were found for group patients. Adsett and Bruch's (1968) earlier research discovered that post-MI patients exhibit considerable anxiety for several years. Their patients also expressed loss of self-esteem and conflict over their dependent/independent relationship with their wives. The wives were also involved in a separate group for spouses of MI patients. They expressed feelings of guilt and anxiety, but lacked the rapport and shared support seen in the patient group. At the time of publishing the study, the survival rate for those in the group was higher than for those patients who

refused to join. Larter's (1976) study on MI wives emphasized the value of information and advice from the nursing staff. The nurse as a liaison between the physician and the wives can communicate more easily, and relate well with these concerned women. McGann's work (1976) on group sessions for MI wives and other family members also found that responding to the family's concerns about the MI patient is very helpful in their acceptance of the illness and how to treat the patient when he returns home.

Steger and Chisholm (1977) studied Rumbaugh's Cardiac Adjustment Scale (CAS) to investigate its use in a cardiac rehabilitation program. They tested its predictive powers in estimating psychological adjustment, patient involvement in rehabilitation and vocational outcome of rehabilitation efforts. Overall, the CAS was found to have little usefulness to make any of these predictions. In another study on psycho-social adjustment, Zheuthen and Goldstein (1977) sought to develop a series of predictive equations to relate concurrent physiological, psychological and socio-demographic variables with levels of future adjustment in a sample of the cardiovascular patient population. It was found that subjects who can be stressed to work levels that approximate 70 to 80% of age and sex predicted maximal heart rates while remaining free from signs of cardiac dysfunction tend to report themselves to be better adjusted than subjects who fall at the other extreme of this

physiological indicator. They also discovered that MMPI scales (1, Hy, F, D. Sc) and an objective, readily derived index of cardiac status account for slightly more than 70% of predictable variation.

Services Available in the Metropolitan Chicagoland Area

Inpatient Programs. At the time of this writing between ten and fifteen hospitals are presently offering educative/psychotherapeutic classes to their MI patients. It is generally the attending physician's choice as to whether the patient should have the opportunity to join. The programs' contents vary little from each other because most are concerned with the management of stress, anatomy and physiology of the infarct, and nutrition.

Outpatient Programs. Of the hospitals surveyed, only two were found to have outpatient programs for those patients who had been involved in the in-house classes. They were structured to have controlled exercise, and one had psychological services available.

Outpatient Programs not Related to Inpatient Programs. St. Francis Hospital is in the process of planning a program of this sort for former MI patients not previously involved in rehabilitation classes. They will stress the same aspects of their in-hospital program, and have an exercise program as well.

Heart Clubs. There are several heart clubs in the Metro Chicago area. Once a month they meet to share concerns and hear a speaker. Both former MI patients and patients whose present condition could lead to an infarct, as well as interested family members attend.

YMCA Exercise Programs. YMCA's and other night programs are now available to offer supervised exercise for heart patients. Stress tests are provided, and the exercise is systematically planned according to the patient's heart status.

Treatment Programs at the Hospitals Used in the Present Study.

St. Francis Hospital and Lutheran General Hospital both operate a five-day program led by a nurse practitioner. The information presented is in Appendix B, as well as various handouts. Their programs include a graphic presentation of the normal heart, definition of myocardial infarction and its ramifications, risk factors associated with heart attacks, exercise, future plans and coping strategies.

Relationship of These Procedures to Contemporary Research and Practice. The literature describes various procedures that have been successful in treating MI patients. The hospital programs integrate the knowledge that the patient must understand his disease and learn to cope with it.

Summary

In summary, within the past decade, we have had an influx of research concerning personality types prone to sustain myocardial infarctions. The research in the late 1960's noted the "Type A" personality type defined by Rosenman as having a higher incidence of heart disease. Concurrent studies were performed several times to substantiate this theory. Further research differentiated between angina pectoralis patients and those having sustained MI's along psychological variables. Angina patients were shown to display a greater tendency toward emotional lability and hypochondriasis than MI patients. MI patients were also shown to have a positive relationship between depression and hostility and epinephrine excretion.

Denial, as well as depression, became a focus of attention when several studies supported the interpretation that the MI patient utilizes this defense mechanism as a general strategy to cope. However, when denial is over-employed, it could possibly be fatal for the patient, because he would have a tendency not to follow doctor's orders during convalescence. Some studies further hypothesized that denial may decrease or ward off depression in the MI patient, but never successfully tested this proposal. Depression, it is suggested remains constant over time, and the level is between that found in normal non-depressed individuals and psychiatrically depressed patients. The degree of depression in the

MI patient is rarely so severe as to require antidepressive medication. A contradictory study reported that patients with higher levels of denial become less depressed midway through their hospitalization. Several authors reported that MI patients who scored exceptionally high on depression indices had a higher mortality rate than other MI patients. This higher level of depression could possibly be a result of ineffective denial as one author discussed.

Different modes of psychotherapeutic and educationally oriented groups have been investigated. The findings indicate that the opportunity for the patient to express himself results in changing his attitudes toward his illness and allows him to view it more realistically. This sharing of feelings and increased information about coronary illness proved to shorten hospital stays and create a positive attitude toward group therapy. Also included in the studies is some discussion of spouse and/or family groups. The purposes of the spouse and family groups are the same as the patient groups. It was found that the wives involved in the groups were able to accept the illness better and valued the opportunity to share their concerns with an informed person.

Thus the current research on psychology in medicine, and specifically relating to cardiac patients, is becoming a new and prolific area of interest.

METHOD

Sample

Twenty-nine male patients who had been hospitalized in a coronary care unit with a diagnosis of myocardial infarction as determined by the house staff of each of the hospitals used served as subjects in the present investigation. The patients selected did not have any other acute medical problems as determined by their medical histories. Twenty-nine patients between the ages of forty-four and seventy-three years of age were studied. Four MI patient groups were examined: 1. Current patients from St. Francis Hospital involved in cardiac rehabilitation groups. 2. Current patients from St. Francis Hospital not involved in cardiac rehabilitation groups. 3. Current patients from Lutheran General Hospital involved in cardiac rehabilitation groups. 4. One patient from Lutheran General not involved in cardiac rehabilitation. Table 1 presents a numerical description of the subjects according to age, occupation, education, previous cardiac status, location of infarct, and race. Prior cardiac status was determined from patient records and consultation with attending physicians. Present health status was also determined by attending physicians.

TABLE I.

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS
OF THE FOUR PATIENT GROUPS

Subjects	St. Francis in-treatment N=8	St. Francis not in-treat- ment N=13	Lutheran General in treatment N=7	Lutheran General not in-treat ment N=1
Age				
Range	48-62	44-73	44-63	57
Mean	56.142	58.714	54.857	57
Race				
White	7	11	6	1
Nonwhite	1	2	1	
Occupation				
Professional	1	3	1	
White collar	2	6	5	1
Not white collar	5	4	1	
Education				
Below High School				
Graduate	3	2	1	
High School Graduate	2	3	4	1
Some college	2	3		

TABLE I Cont. DEMOGRAPHIC AND CLINICAL CHARACTERISTICS
OF THE FOUR PATIENT GROUPS

Subjects	St.Francis in-treatment N=8	St.Francis not in-treat- ment N=13	Lutheran General in treatment N=7	Lutheran General not in-treat ment N=1
College Graduate		2	1	
Some graduate level courses		1	1	
Graduate degree	1	2		
History of previous MI				
Yes	1	4	2	
No	7	9	5	1
Location of MI				
Anterior/lateral	5	4	1	1
Interior/posterior	2	4	3	
Diaphramatic	1	3	1	
Not indicated		2	2	

Procedure

Procedure for Acquiring Subjects

The researcher initially contacted the Chief of Cardiology and/or Medicine at the respective hospitals to gain their approval. When necessary, a presentation to the research committee at the hospital followed in order to acquire approval for the research design. The attending physician documented the myocardial infarction according to cardiac enzyme levels and electrocardiogram changes. After the patient was determined to have sustained an infarct, his attending physician was contacted by the researcher to gain approval for the patient to be interviewed.

Interviewing Procedure

The patients concerned were interviewed two times in the hospital, on the third and seventeenth days of hospitalization. A small fraction of the sample were discharged prior to the seventeenth day, and were contacted by mail. Each hospital session was approximately twenty minutes in length. The third interview was conducted by mail ninety days after the patient's admission date to the hospital. If the patient did respond within a week, the interviewer recontacted him by phone and by mail.

Presentation of the Interview to the Patient

Each subject was informed that the author is a Ph.D. candidate in Educational Psychology at Loyola University of Chicago. It was explained to him that this is a

study of the effect of cardiac rehabilitation on people who have gone through an illness similar to his. The same instructions were given to each patient before the tests were presented.

The Interview

The first interview consisted of: a deomographic questionnaire and denial scale given verbally to the patient. When he was able, he filled out the Depression Adjective Checklist (DACL) himself. If not, the interviewer did it for him. The second and third sessions consisted of administration of the depression scale and the portion of the denial scale that did not require nursing affirmation and communication.

Physiological Tests

Table II displays electrocardiogram changes and cardiac enzyme levels which were followed to reveal physiologic changes across days per each patient in the sample as recorded by the hospital.

TABLE II.

RANGES AND MEANS OF CARDIAC
ENZYMES OF TREATMENT AND
NON-TREATMENT GROUPS
MEASURED AT HIGHEST POINT

GROUP	CPK*		LDH**		SGOT***	
	Range	\bar{x}	Range	\bar{x}	Range	\bar{x}
In treatment	2340-128	873.0	1340-131	441.923	446-33	143.615
Not in treatment	2290-93	782.4	1380-119	442.0	739-52	205.0

* CPK=Creatine Phosphokinase, normal range: 0-100

** LDH=Lactate Dehydrogenase, normal range: 7-26

*** SGOT=Serum Glutamate Oxalacetate Transminase, normal range: 55-134

Instrumentation

Depression Adjective Checklist (Bernard Lubin)

The Depression Adjective Checklist measures subjective depressive mood, and provides brief, reliable, and valid measure of transient depression. The DACL has seven checklists with high internal consistency (.79-.90). Split-half reliabilities range between .82 and .93 for a normal population (Buros 1976). The forms are considered to be parallel for no significant differences were found among the lists. Validity is shown by the DACL's ability to discriminate between depressed and nondepressed patients and "normals". The DACL correlates positively with both the MMPI D-scale and the Beck inventory. It is considered effective for the repeated measures use.

Hackett-Cassem Denial Scale

The Hackett-Cassem scale measures denial in the patient who has sustained a myocardial infarction. The authors are presently developing other validating procedures, but the scale effectively quantitatively separates and identifies three clinical groups of deniers: major, partial, mild according to their total scores on the scale. The group of patients upon which the instrument was designed, showed differences between pairs of mean scores for each of the three denial groups that were highly significant. Reliability coefficients (test/retest) of from .71 to .87 were significant at the .025 level.

Demographic Questionnaire

The questionnaire was developed by the investigator to gather demographic data. It appears to be reliable as the information given by the patient can be checked on hospital records and by contacting relatives. Validity is assumed in that the patient is expected to give honest responses. Also, the information gleaned from the instrument is pertinent and the questions are expressed in a manner consistent with other forms commonly in use.

Statistical Analysis

Since only two hospitals were available for this study, it is assumed that each of the two hospitals is a randomly selected hospital representative of the general hospital population-at-large. Furthermore, it was felt that any differential treatment effect would be independent of hospital. There did not appear to be any compelling reason to assume that any such treatment x hospital interaction would exist. Unfortunately, for logistic reasons, no control group could be accommodated in one of the hospitals. This left a vacant block of necessarily missing data as one-fourth of the entire three-way split plot design was vacant.

The hospital programs were assumed equivalent, in that St. Francis Hospital rehabilitation classes were specifically modeled after those at Lutheran General. Different people comprised the psycho/educative staffs of each hospital.

Their theory, handouts, diagrams, and group structure were close to identical. Both are suburban hospitals drawing from a very similar population racially, educationally and occupationally. The atmosphere of both coronary care units is essentially the same, and although St. Francis Hospital's facility is more modern, patients at both hospitals are in constant observation and monitoring by the staffs. These similarities made it possible to consider the variables as in treatment (involved in psychoeducative rehabilitation classes) and not in treatment (not involved in classes).

Due to these constraints, it was decided that the analysis of the corresponding two-way split plot (treatments over time) realized by collapsing on the hospitals variable would not suffer greatly in comparison to the incomplete and unbalanced three-way split plot which was the original design of choice.

The hypothesis that depression and denial are inversely correlated was tested by correlational methods utilizing the Pearson's Rank Order Correlation Coefficient. Patients from all four sources were used for this test. The hypothesis is stated: Denial and depression are inversely correlated in patients following a myocardial infarction.

A split plot factorial design was used to test the hypothesis: Post-infarct patients who go through an edu-

cating and counseling experience such as the coronary rehabilitation classes, will have lower levels of both depression and denial. Analysis of variance procedures follow to determine the main effect by groups and by repeated measures.

Quadratic trend procedures were to be used to test the hypothesis that there is a curvilinear relationship between depression and time passed since onset of MI and denial and time for the post myocardial infarction patient.

Denial is measured by the Hackett-Cassem Denial Scale. The scale has a range of scores from 0-64. Depression will be measured by the Depression Adjective Checklist which has a range of scores from 0-32 (34 on some forms).

RESULTS

The null hypotheses may be stated thus:

1. $H_0: \rho_{\text{Depression} \times \text{Denial}} < 0, t=3d, 17d, 90d$

2. For Depression:

$$H_0: \mu_{\text{treatment}} = \mu_{\text{non-treatment}}$$

3. For Denial:

$$H_0: \mu_{\text{treatment}} = \mu_{\text{non-treatment}}$$

The results of the experiment indicate that the null hypotheses, as originally conceived, cannot be rejected. The following description and display of the data collected and tested explains the design of the experiment, the scoring of the data, the three null hypotheses, the calculation of power, and the trends of the constructs, denial and depression, over time.

Design

The proposed design was to have been a three-way split plot factorial over Treatments, Hospitals and Time. However, due to the problem posed by a virtually vacant block within one of the two hospitals, and in view of the assumption that no hospital interactions were expected, the variable, Hospital, was collapsed, leaving a two-way split plot over Treatments and Time. It was considered most

effective to collapse on the hospitals variable due to the equivalency of the programs at each, and also due to the lack of a control group at Lutheran General Hospital. This empty block (one-fourth of data necessarily missing) would have resulted in an incomplete and imbalanced three-way split plot, so the two-way split plot was the design of choice.

The following table displays all data collected from the experiment relating to the variable, depression.

TABLE III

Means and Standard Deviations of Depression as Measured by the DACL for Treatment and Non-Treatment Groups

GROUP		3 day	17 day	90 day	Average
In Treatment	\bar{x}	42.93	46.69	45.46	45.02
	S_D	6.85	8.53	10.59	
	n	15	13	13	
Not In Treatment	\bar{x}	46.21	47.30	48.80	47.44
	S_D	7.45	8.34	11.06	
	n	14	10	10	

Table III above illustrates the lack of significant change in the means of depression across days and between treatment groups. The missing observations were greater for the non-treatment than for the treatment group. The means between the groups at each testing remain quite similar even though there are missing observations at the seventeenth and ninetieth days.

Table IV depicts all data collected from the experiment relating to the variable, denial.

TABLE IV

Means and Standard Deviations of Denial
as Measured by the Hackett-Cassem Denial Scale
for Treatment and Non-Treatment Groups

<u>GROUP</u>		3 day	17 day	90 day	Average
In Treatment	\bar{x}	8.66	6.923	6.346	7.31
	S_D	2.69	1.83	3.02	
	n	15	13	13	
Not in Treatment	\bar{x}	8.285	7.313	7.45	7.68
	S_D	2.86	1.87	2.15	
	n	14	8	10	

Table IV shows the similarity of means across days and between groups. The missing observations of five at the seventeenth day, and of four at the nintieith day for the non-treatment group do not seem to have affected the overall averages between the two groups. Again, the means at each testing are not significantly different.

Processing of the Data

The data was processed in the following manner:

Depression Analysis Checklists (DACL): Each DACL protocol was hand scored by the researcher. The scores were then converted to standardized scores by means of a table provided in the manual. This was done to equate the totals since scales A and B have thirty-two responses and scale E, thirty-four. Protocol sets of less than three interviews were not analyzed. The data presented here is thus based on eleven Treatment and eight Non-treatment subjects who met this criterion.

Hackett-Cassem Denial Scale: Each Denial scale was hand-scored by the researcher. Since the nursing staff was not available for most of the second interviews (seventeenth day) and for all of the third interviews (ninetieth day), only the questions that appeared consistently in each interview were used. Eleven Treatment and six not-in-treatment subjects were used due to missing data.

Hypothesis I: Denial and depression are inversely correlated in patients who have sustained a myocardial infarction.

Using the raw data in the form of paired observations, the first hypothesis was tested:

$H_0: \rho_{\text{Depression} \times \text{Denial}} \leq 0, t=3d, 17d, 90d$
 (where ρ is the Pearson Product Moment Coefficient, and the appropriate statistic is the t-statistic: t_s)

Table V displays the results.

TABLE V

Display of the Correlation Coefficients
and the Related Tests of Significance

	t-3d	t-17d	t-90d
n	29	20	23
r	+0.26	+0.40	+0.36
t _s	+1.37 ^{ns}	+1.85 ^{ns}	+1.77 ^{ns}

Note that for any of the correlations to have been significantly less than zero ($\alpha=5\%$), the corresponding t-values would have necessarily had to have been less than about -1.64.

The conclusion from the above information is that depression x denial were not negatively correlated in the sample studies at any time.

The first correlation coefficient depicting the relationship between denial and depression is .26, the t-statistic of 1.37 shows that this does not differ significantly from zero. Figure 1 shows pictorially the relationship between denial and depression at the first interview. The data included are standardized scores derived using the DACL manual.

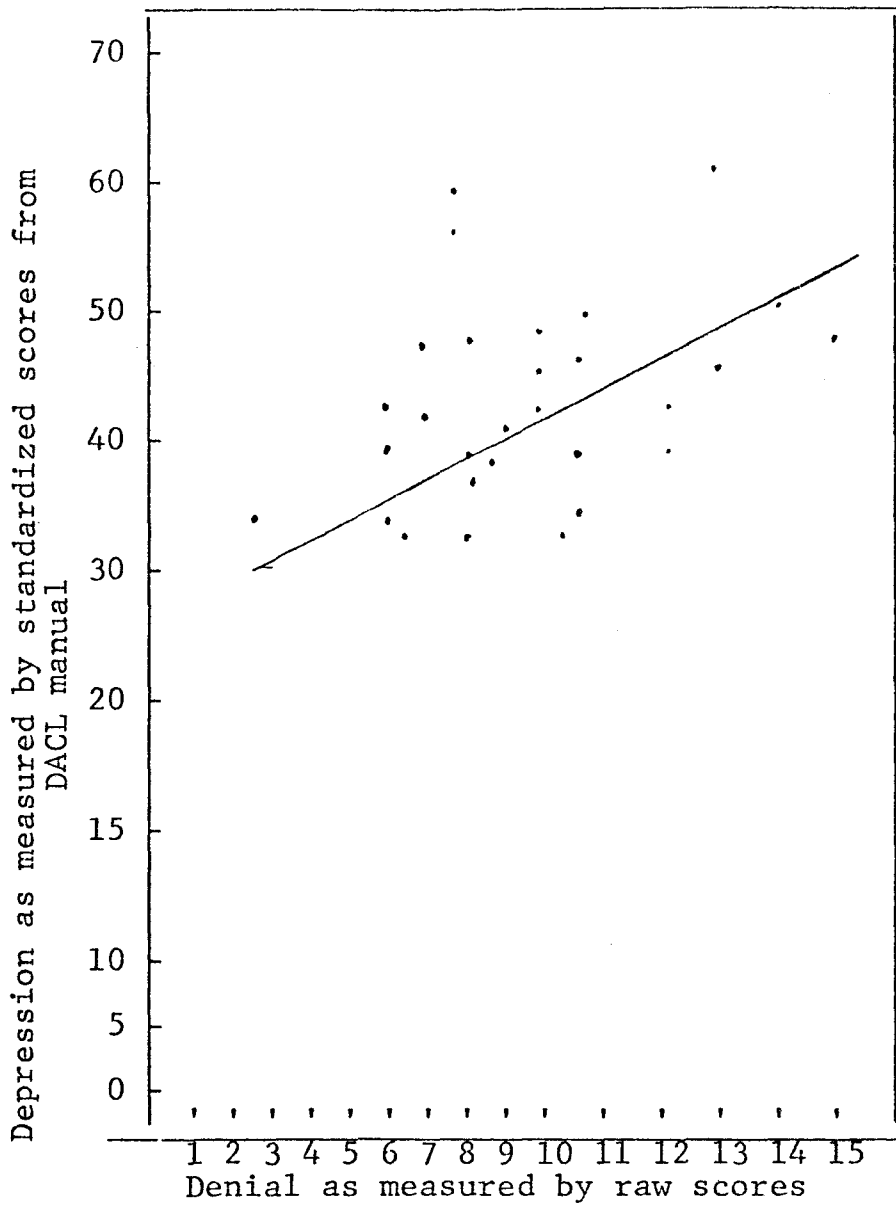


Fig. 1. Day Three: First Interview
Correlation between levels of
Denial and Depression, which
includes all patient data.

Although a positive trend can be observed at day three, it was not statistically significant at the .05 level.

Table V indicates that the second correlation coefficient depicting the relationship between denial and depression is .40, the t-statistic of 1.85 shows that this is not significantly different than zero. Figure 2 displays the scattergram of the relationship between the two variables at the second interview. The data plotted are standardized scores referenced from the DACL manual.

Figure 2

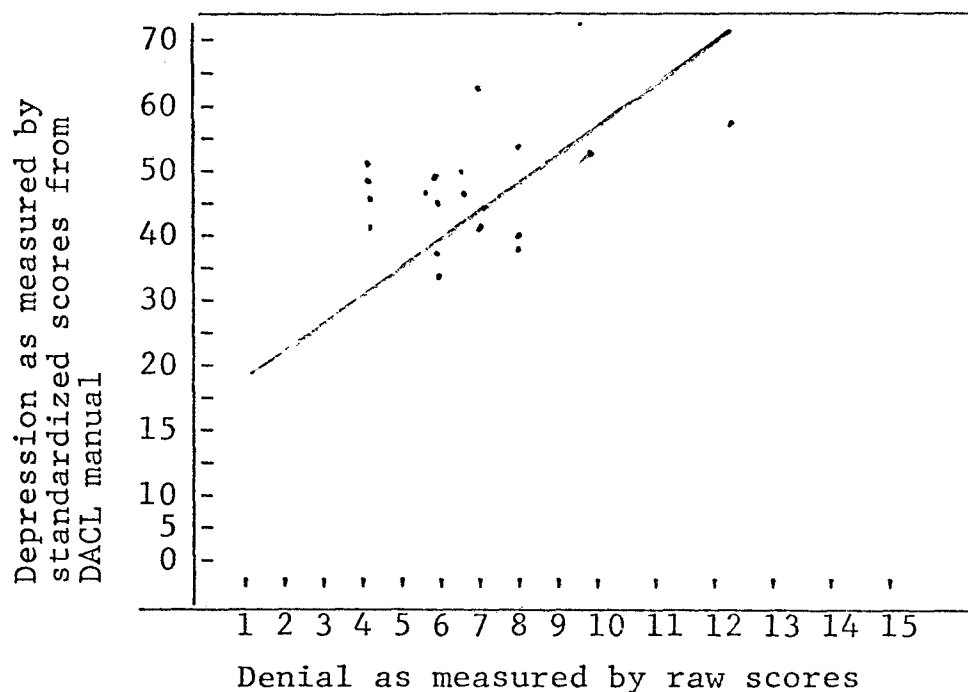


Fig. 2. Day Seventeen: Second Interview correlation between levels of Denial and Depression, which includes all patient data.

Thus, Figure 2 illustrates the significant positive correlation between denial and depression at an alpha level of .05.

Table V shows that the third correlation coefficient .36 and the t-statistic of 1.77 does not differ significantly from zero to show a negative trend. However, Figure 3 depicts the relationship between denial and depression as positive and significant at the .05 level.

Figure 3

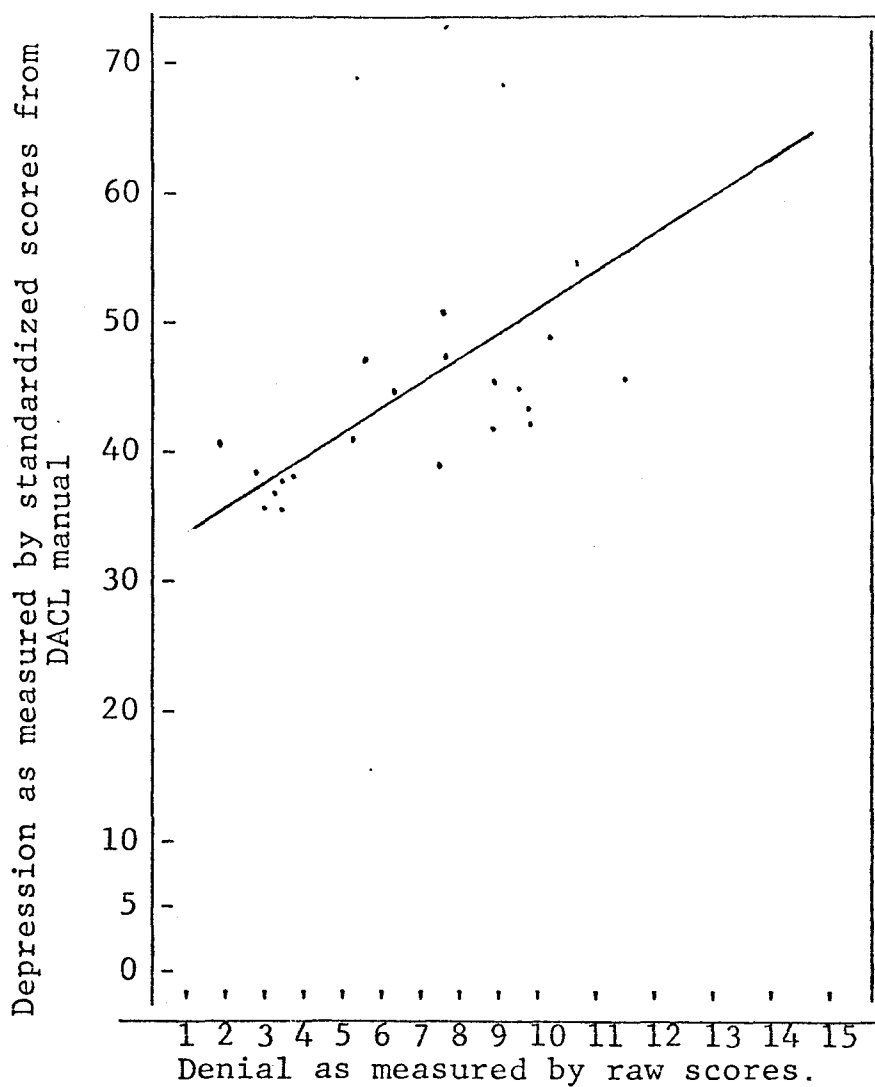


Figure 3. Day Ninety: Third Interview, Correlation between levels of Denial and Depression, which includes all patient data.

Hypothesis II: Post-infarct patients who go through an educating and counseling experience such as coronary rehabilitation classes, will have lower levels of both denial and depression.

A two-way split plot design was utilized due to a vacant block resultant from non-treatment control group at Lutheran General Hospital. Missing observations at the seventeenth and ninetieth days resulted in nineteen complete data sets, since there is no available statistical technique to handle this problem.

The treatment (T+) and Non-treatment (T-) groups were then compared to test the following hypotheses about Depression:

1. $H_0: \mu \text{ treatment} = \mu \text{ non-treatment}$
2. $H_0: \mu \text{ 3 day} = \mu \text{ 17 day} = \mu \text{ 90 day}$
3. $H_0: \mu \text{ T+x3 day} = \mu \text{ T+x17 day} = \mu \text{ T+x90 day} =$
 $\mu \text{ T-x3 day} = \mu \text{ T-x17 day} = \mu \text{ T-x90 day}$

The means on the DACL for treatment and non-treatment groups from patients with complete data sets are displayed in Table VI. It can be noted that these means from eleven treatment and eight non-treatment do not differ significantly from the data presented on Table III, utilizing all collected data. It can thus be surmised that the nineteen patients are representative of the original twenty-nine tested.

TABLE VI

Means and Standard Deviations of Depression
as measured by the
Depression Adjective Checklist (DACL)

Groups		3d	17d	90d	Avg.
Treatment	\bar{x}	41.8	45.18	45.82	44.26
	S_D	7.29	5.12	11.51	
	n	11	11	11	
Non-treatment	\bar{x}	44.38	44.75	50.87	46.67
	S_D	5.18	6.6	11.49	
	n	8	8	8	

The results derived from the analysis of variance are presented below. Only the nineteen complete interviews were utilized in computation.

TABLE VII

The Results from ANOVA On Depression

Source of Variation	SS	df	MS	F
A	23.42	1	23.42	0.24 ^{ns}
Subjects within Groups	1680.68	17	98.86	
B	95.76	2	47.88	0.89 ^{ns}
AB	19.84	2	9.92	0.18 ^{ns}
B x Subjects within Groups	1831.02	34	53.85	
Total	3650.72	56		

The results derived from the analysis of variance procedures indicated that there is no differential treatment effect over treatment between groups. Therefore the null hypothesis $\mu_{\text{treatment}} = \mu_{\text{non-treatment}}$ cannot be rejected. The analysis cannot reject the hypothesis that there is a differential treatment effect over time as well as also concluding that the hypothesis of a treatment effect over time x treatment interactions cannot be rejected. All hypotheses were not significant at alpha levels well above .5. Since primary interaction effects for depression were

not significant, no purpose would have been served by checking for quadratic trends or by doing multiple comparisons a la Dunn.

The means and standard deviations on the Denial Scale for seventeen patients are presented below in Table VIII:

TABLE VIII

Means and Standard Deviations for Denial
as Measured by the Hackett-Cassem Denial Scale

Groups		3d	17d	90d	Avg.
Treatment	\bar{x}	8.55	6.82	6.0	7.12
	S_D	2.84	1.87	3.16	
	n	11	11	11	
Non-Treatment	\bar{x}	8.5	6.0	7.5	7.33
	S_D	3.94	3.93	2.51	
	n	6	6	6	

When these means are compared with the total patient means on the denial scale, the difference is not significant. Therefore it is possible to assume that the seventeen complete sets are representative of the original twenty-nine subjects.

The treatment (T+) and non-treatment (T-) groups were compared to test the following hypotheses about Denial:

1. $H_0: \mu_{t+} = \mu_{t-}$
2. $H_0: \mu_{3 \text{ day}} = \mu_{17 \text{ day}} = \mu_{90 \text{ day}}$
- and 3. $H_0: \mu_{t+x3 \text{ day}} = \mu_{t+x17 \text{ day}} = \mu_{t+x90 \text{ day}} =$
 $\mu_{t-x3 \text{ day}} = \mu_{t-x17 \text{ day}} = \mu_{t-x90 \text{ day}}$

The results derived from the analysis of variance procedures are displayed below.

TABLE IX
The Results from the ANOVA on Denial

Source of Variation	SS	df	MS	F
A	1.40	1	1.40	0.11 ^{ns}
Subjects within Groups	189.93	15	12.66	
B	9.58	2	4.79	0.90 ^{ns}
AB	1.66	2	0.83	0.16 ^{ns}
B x Subjects within Group	159.27	30	5.31	
Total	361.84	50		

The results derived from analysis of variance procedures do not reject any of the three hypotheses concerning differential treatment effect between groups over treatment, over time, or in treatment x time interactions. Again, all hypotheses were not significant at alpha levels above .50.

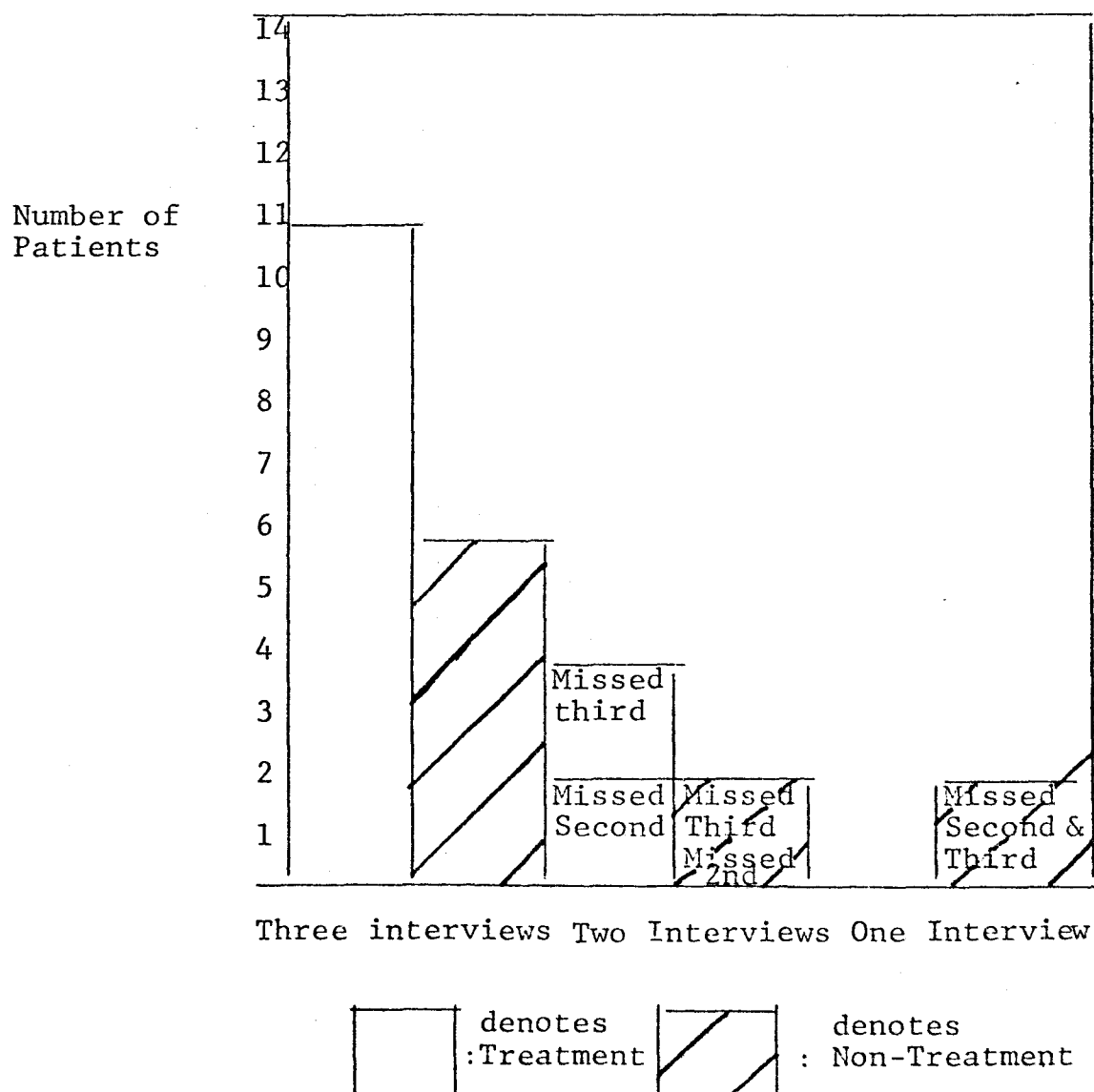
In view of the obvious lack of significance, neither multiple comparisons nor trend analysis were performed. Kirk(1968) states that when the trend does not depart from linearity, Sheffe or Dunn's test cannot be used.

The unusually low F-statistics were caused by the large mean square error involved and may be explained by the possibility that the missing data may not have been missing randomly with respect to treatment response.

Figure 4 illustrates this possibility.

Figure 4

Differences Between Treatment and
Non-treatment Groups with Respect
to Rate of Interview Return



The bar graph (figure 4) compares the rate of interview return by patients voluntarily. It is possible to observe that those patients involved in the rehabilitation classes did have a higher rate of return, and not one neglected to return both the seventeenth and ninetieth-day interviews. Hence, there may have been a missing data x treatment interaction.

Although the differences between the means of the treatment groups were not different statistically, it is possible to view a direction of trend on each construct over time. Figures 5 and 6 display this information.

Figure 5

Depression Means as scored by the DACL
at each interview

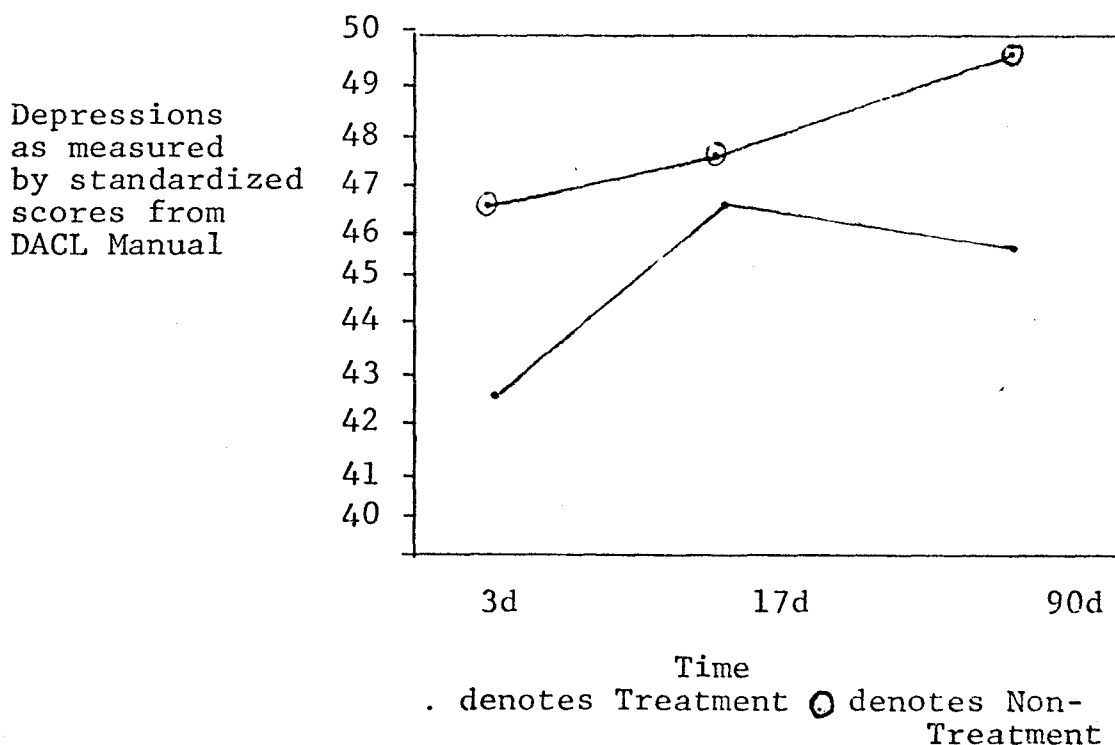
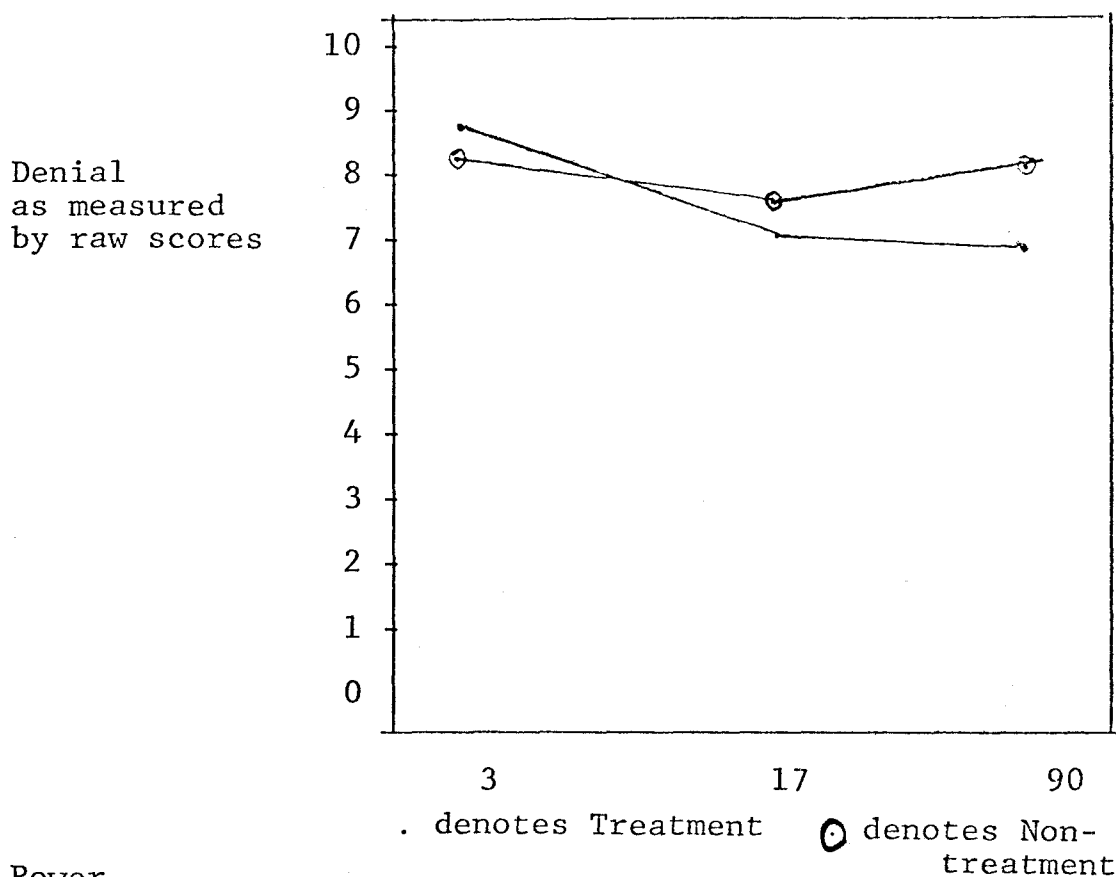


Figure 6

Denial Means as computed from raw
scores at each interview



Power

Even though no significant difference between the groups (treatment and non-treatment) was found, valuable information may still be collected. Although the null hypotheses: post-infarct patients who go through rehabilitation classes will have lower levels of both depression and denial and there is a curvilinear relationship between depression and time, were not proven to be true, credibility for the null hypotheses may be found using the concept of power. Using methods discussed in Kirk (Kirk, 1968) values of ϕ

were calculated and Tang's power charts were referenced. In order to reference these tables, it is necessary for the experimenter to determine a minimum difference between the groups that would show practical evidence of group differences. The resulting values of alpha, ϕ , and power are contained in Table X.

Table X

Power of the Test on the Main Effect
for Depression and Denial for Treatment
and Non-Treatment Groups

		Minimum Difference	ϕ	Power
Depression	.05	10	3.03	.98
	.05	5	1.52	.50
Denial	.05	2.5	1.19	.78
	.05	2	3.56	.60

The powers of .98 and .50 at the .05 level respectively for depression are sufficient to determine a departure from the null hypothesis. The power for denial with a difference of 2.5 and 2.0 points is .78 and .60 respectively. This also is sufficient power to determine departure from the null hypothesis.

Conclusion

Thus, although the null hypotheses originally conceived could not be rejected, some valuable information was derived from the data. Namely, that denial and depression

can be positively correlated following a myocardial infarction, and that educative/psychotherapy classes, as they are presently designed, do not positively improve the patient's emotional response to his illness when measured on the variables of denial and depression.

The data have also revealed descriptive trends that have been previously verified in the literature review and depicted in Figures 5 and 6. However, no interpretive statement can be made since there was no statistically significant difference between the two groups.

DISCUSSION

The expectation that educative/psychotherapeutic rehabilitation classes would have an effect on the two emotional responses of denial and depression was not upheld. The treatment group showed no significant decrease in these variables when compared to the non-treatment group.

From this evidence, then, it can be inferred that, if patients not involved in the classes have close to the same levels of denial and depression as those who go through the group process, then the content and method of the classes themselves must come into question.

Although it was determined that the two treatment groups were not statistically significantly different, the possibility of medical significance exists. If the patients who attended the rehabilitation classes were found to have an improved lifestyle, increased longevity, and freedom from coronary symptoms, medical significance could be assumed. A long-term longitudinal study of patients who do and do not participate in coronary care classes is indicated to test for medical significance. At this point in the present study, evidence of medical significance has not been sub-

stantiated.

The courses in both hospitals were theoretically designed to meet both the educational and psychological needs of the patients. The content included the anatomy of the circulatory system and causes of myocardial infarction, nutrition and cholesterol, coping with stress and life-management following an MI, and supportive group interaction. The objective aspects of the course, as observed by the researcher, appeared comprehensive and the information was easily understood. The subject matter was presented both visually and orally and the subjects were encouraged to ask questions. At face value, it is difficult to criticize their methods in this aspect of the class. Since the study dealt with psychological variables, it is necessary to examine whether these needs were actually met. The staffs of both rehabilitation classes were registered nurses trained to teach the course. The St. Francis course also provided a psychologist, outside of classtime, to those patients who requested the service.

Although the opportunity exists for the group leaders to deal with group interaction, mutual support, and individual problem-sharing, perhaps the lack of training of the teaching staff in group facilitating skills and therapy prevents the expression of feelings and fears by the patients. It is possible that the presentation of the information about heart disease may prove stressful to the

"educated" patient when his immediate emotional response is not perceived. In comparison, the lack of knowledge of the "uneducated" patient dealing with his fears alone is not significantly more stressful.

It is interesting to note that, by the third day of hospitalization, most patients scored below the standardized norms of a non-psychiatric population, although all reported, in retrospect, extreme depression upon admittance to the hospital. Since retrospective data is not considered statistically usable, these measures were discarded. It could be surmised, then, that the patients may be entering the course at the wrong period of their convalescence. The concept of presenting the course while the subject has inpatient status does provide a captive audience, but does not change his emotional response. The literature supports the assumption that there are personality correlates for infarction patients, and that an adverse emotional reaction to the infarction can inhibit recovery. Then, it could be suggested that according to patient self-report, psychological support services should be available shortly after admittance, and the educative/psychotherapy classes should include a psychologist at each session to deal with any immediate problems that might arise.

The Pearson Product Moment test on correlations revealed, surprisingly opposite to expected findings, that when depression increased or decreased, so did denial in

the same direction. It was originally conceived that as the patient accepted the fact that he has sustained a myocardial infarction denial would be lessened. It was hypothesized that once the patient realized that he had endured a life-threat, that depression would ensue. While collecting the data, the researcher was able to informally discuss the occurrence of the MI. Although some patients were subdued in recollection, all readily described the event in exacting detail. This "reliving" of the experience verbally may have provided the patient the opportunity to 1) come to grips with the situation by objectifying it, and 2) measure his own progress against how he remembered he felt when admitted to the hospital, and at the present time. Since it was discovered that denial and depression are positively correlated, the rehabilitation classes should concentrate on the immediate confrontation of these responses first, before dealing with the more content-related aspects of the course. This would enable the patient the opportunity to alleviate his stress and then understand the etiology of his disease while planning for the future.

While analyzing the data, certain problems in data-collection were discovered. At the outset, it was very difficult to obtain permission to conduct this research. Both physicians and nurses have a tendency to be protective of their patients, and rightfully so. Therefore, the re-

sistance met resulted in a small sample of patients that fit the pre-established parameters required. Although the subjects in the sample were considered to be randomly selected, in fact they had the choice offered of completing and mailing the second and third interviews on their own, or not responding at all. This element of choice resulted in more patients from the treatment group (eleven) than from the non-treatment group (eight) responding voluntarily. The study should be repeated with more patients to increase the power of the tests and also in a more structured fashion to eliminate the possibility of a treatment x missing data interaction.

The information derived from this study encourages related research in this area.

Since the patients who were mailed interviews had a choice of whether to return them or not, perhaps those who did respond displayed a greater interest in and/or acceptance of their illness. A study could be performed which would distinguish between those patients in treatment and those who were not and the respective rates of independent responses. If it would evidence that patients involved in in-patient groups have a continuing interest after discharge, it could possibly be inferred that there is a need for the coronary classes to be continued on a voluntary basis after discharge. The coronary care unit, and later placement on a medical floor in the hospital, creates a secure and protective environment for the MI

patient. Upon returning home he must again face stressful situations and decisions. This could be extremely threatening for the patient ill-equipped to meet these challenges.

Another area where further research is indicated is to compare Kubler-Ross' stages of mourning (denial, anger, depression, acceptance) with the similar progressive stages of emotional response which the MI patient experiences. The rehabilitation groups could respond to this trend, if discovered, by organizing the classes to correspond to these transitional stages.

In summary, the educative/psychotherapeutic groups studied in this research had no apparent influence on decreasing levels of denial and depression in the myocardial infarction patient. It could be concluded, then, that the method of instruction, content of the course, and training of the nurse-facilitators must be questioned. Also, since denial and depression appear to be positively correlated, the staff of the rehabilitation classes must be responsive to these simultaneous reactions. Presently, before any more time is unproductively spent by patients involved in these rehabilitation groups, the groups themselves should be redesigned to more fully meet the patient's psycho/emotional needs.

SUMMARY

The purpose of the investigation was to ascertain whether educative/psychotherapeutic rehabilitation groups conducted in local hospitals the week following myocardial infarction (MI) decreased levels of denial and depression. The literature has indicated that both denial and depression inhibit, and possibly prevent, successful recovery in the post-infarct patient and it was hypothesized that the in-hospital rehabilitation classes would reduce levels of these psychological variables by educating the patients. The research was conducted at two hospitals utilizing twenty-nine male patients between the ages of forty-four and seventy-three years who had sustained certified Myocardial Infarctions. The patients were randomly divided into treatment (in rehabilitation class, n=15) and non-treatment (those not assigned in rehabilitation class, n=14) groups. The educative/psychotherapeutic classes at both hospitals were systematically observed utilizing the DACL...and noted to stress the same aspects of rehabilitation for the patients. The patients were observed via interviews consisting of a questionnaire, depression checklist, and denial scale. The interviews took place in person on the third and seventeenth

teenth days of hospitalization, and ninety days later via mail. Pearson Product Moment correlation coefficients indicated that denial and depression were positively correlated in both groups. A two-way split plot over treatment and time, collapsing on the variable hospital, was utilized to test treatment effect of educative/psychotherapy groups. Results indicated that the treatment had no demonstrable influence on either psychological variable. These findings could be used to evaluate some aspects of the treatment programs' effectiveness and to consider the meaningfulness of two constructs commonly held to be important in rehabilitation after myocardial infarction: denial and depression.

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APPENDIX A

I, the undersigned, will participate in Mrs. Whitehead's study concerning rehabilitation for patients who have sustained a heart attack. I understand that I will be involved in three interviews concerning my feelings about my experience and how I feel at that moment. I permit her to use the information derived from the interviews and subsequent tests in her research. I have been informed that my identity will remain anonymous.

Signature: _____

Date: _____

Dear Doctor,

Will you please give permission for your patient: _____ to participate in Mrs. Whitehead's study concerning patients who have sustained an acute myocardial infarction? The project consists of three interviews (the first on the third day of hospitalization after the MI has been documented, the second on the seventeenth day, and the third by mail ninety days after admission) which are brief and non-stressful to the patient. The study is concerned with the psychological variables of depression and denial following the MI, and the effect of the in-hospital coronary classes on these variables. The patient's identity will remain anonymous.

Thank you.

YES _____

NO _____

Signature: _____

Date: _____

NAME:

ADDRESS:

Birthdate: _____ Age: _____

Marital Status: _____

Children: (number and ages) _____

Grandchildren: _____

Parents: Alive _____ Deceased _____
If deceased, cause of death _____
Age at death _____

Education: High School graduate _____
College graduate _____
Some graduate level courses _____
Masters degree _____
Doctorate _____
Other _____

Type of business or profession: _____
Years at present job _____
Hours/week at job _____
Most recent promotion _____
Satisfaction with present job situation _____

Characterize usual business day choosing from
these terms: enjoyable, smoothe, hectic, tense,
easy, hard, busy, quiet, confusing, organized,
too long, too short, (add some not included if
desired) _____

Own business _____
Actively seeking new position _____

Activities:

Vacation weeks/year: _____
Type of vacation: _____
Active sports participation: golf _____ Raquet-
ball _____ Tennis _____ Handball _____ Swimming _____
Other _____
Number of times/week _____
Other types of activities: i.e. gardening,
housework, _____

Favorite form of recreation: _____
Sedentary hobbies: _____
Hours of TV watching/day: _____

Health:

Heart trouble diagnosed as _____
Age at which discovered _____
Presenting complaints _____

Physician's recommendations _____

Prescriptions _____

Dosage/day _____

Hospitalization _____ Duration _____

Cause for Hospitalization _____

See physician _____ times/year

Involved in psychotherapy: presently, previously

Duration of therapy _____

Smoking: _____ packs/day

Quit, but smoked _____ years _____ packs/day

Future Plans:

Retirement: presently _____ Cause of retirement _____

Age at retirement _____ Plan to retire _____

(If retired, please fill in business questions
as they applied in the past)

Personal goals _____

Additional comments:

Please circle the correct response.

Name _____

1. Was there any delay in consulting for help after onset of symptoms?
 - a. 0-1 hour
 - b. 1-5 hour
 - c. 5-24 hour
 - d. 24 hours or more
2. Did others help you decide medical care was needed?
 - a. No
 - b. Maybe
 - c. Definitely
3. How do you feel today? Are any symptoms present?
 - a. No
 - b. Maybe
 - c. Definitely
4. Was your doctor too strict in the hospital?
 - a. No
 - b. Maybe
 - c. Definitely
5. After the onset of your symptoms, were you at any time scared of: (check response)

	<u>YES</u>	<u>NO</u>
Death	_____	_____
Another Heart	_____	_____
attack	_____	_____
Invalidism	_____	_____
Monitor Alarm	_____	_____
going off	_____	_____
Irregularities on	_____	_____
monitor	_____	_____
At the peak of	_____	_____
symptoms	_____	_____

Dear Mr.

Remember that nice young lady who asked you all of those questions while you were recovering in the hospital? I am back again with the continuation of your interview. Please fill out the enclosed forms and mail them back to me in the stamped and addressed envelopes. This is very important to me, as you are an essential individual in my study.

If you have any questions, please phone me at: 432-6788. Please do this today. I need your help.

Thank you.

Very truly yours,

Lynn Dee Whitehead
1477 Avignon Ct.
Highland Park, Illinois 60035

APPENDIX B

Cardiac Rehabilitation Classes

Objective	Course Content	Activities
To understand how the normal heart works	<p>I. Anatomy and Physiology of the heart.</p> <p>A. Structure of heart</p> <ol style="list-style-type: none"> 1. Four chambers 2. Location of heart 3. Size of heart <p>B. Circulation of blood through the heart.</p> <ol style="list-style-type: none"> 1. Deoxygenated blood returning from the head and arms return to the rt. atrium through the superior vena cava, deoxygenated blood from the trunk and legs return to the rt. atrium through the inferior vena cava ----from the rt. atrium through the tricuspid valve into the rt. ventricle; from here the blood goes through the pulmonary artery and then separates into the lt. and rt. arteries and then enters the lungs where it replaces CO_2 with O_2. This oxygenated blood returns to the heart via the pulmonary veins which lead into the lt. atrium and through the mitral valve into 	<p>Name them using heart diagram.</p> <p>Have pt. place his hand over his heart.</p> <p>Compare size to the size of a man's closed Fist.</p> <p>Trace a drop of blood through the heart and lungs.</p>

Objective

Course Content

Activities

the lt. ventricle.
 The lt. ventricle
 pumps the oxygen-
 ated blood into the
 body via the aorta.
 The 1st branches of
 the aorta are the
 coronary arteries
 which supply the
 heart with the nec-
 essary blood supply
 which enables the
 heart to pump.

- C. Conduction system Briefly mention
 of Heart. Suffice that Potassium
 to say the heart is necessary to
 able to pump because maintain this
 it has its own elec- system.
 trical system.

To define what a
 heart attack is
 and its causes.
 To explain what
 happens to the
 heart after a
 heart attack
 occurs.

II. Definition of a Heart Attack

- A. A sudden interrup- Draw a picture of
 tion of blood flow a coronary art-
 through the coron- ery and what hap-
 ary arteries which pens with an MI.
 results in the
 death of the tissue.
 1. Other terms which
 mean the same as
 heart attack.
 a. Coronary Em-
 bolism
 b. Coronary Oc-
 clusion
 c. Myocardial
 Infarction MI
 d. Coronary
- B. Causes of a Heart
 Attack
 1. Embolism in a cor-
 onary artery
 a. Definition: a
 mass of undis-
 solved matter,
 may be a com-
 plication of
 arteriosclerosis,
 usually a blood clot.

2. Arteriosclerotic Heart Disease
 - a. Definition:
Thickening, hardening, and loss of elasticity of the coronary arteries which results in altered function of the heart. It is a normal part of aging.
3. Prolonged constriction of the coronary arteries
 - a. May be caused by excessive smoking, or high stress situations.

III. What happens to the heart after a heart attack.

- A. Blockage of one of the coronary arteries by one of the above causes leads to death of the tissue. Once this has happened, the heart attempts to bring a new blood supply to the dead area by developing what is known as collateral circulation (a system of blood vessels paralleling the coronary arteries which maintain the supply of blood to the affected area. At the same time white blood cells move into the damaged area of heart muscle and set the stage for healing.
- B. Factors which will affect the length of time needed for recuperation.
 1. Size of the damaged area.
 2. The effectiveness of the collateral circulation.

Objective	Course Content	Activities
	3. The individual person's own rate of healing.	
	C. It takes approximately 6 weeks before the damaged area in the heart has healed completely and scar tissue has formed.	
	D. Differences between the symptoms of a heart attack and anginal pectoris pain.	Refer to visual chart comparing the two.
	IV. Risk Factors associated with Heart Attacks.	
To discuss the various risk factors associated with heart attacks.	A. Heart Disease-Leader in the cause of health problems--over 670,000 deaths caused by heart attacks each year.	
	B. Predisposing Factors	
	1. Factors which cannot be controlled	
	a. Heredity--incidence of heart disease already in the family.	
	b. Sex--more males are prone to heart attacks than women; however, this is rapidly changing due to the new roles of women. Women also seem to be "immune" to heart attacks previous to menopause but after this time the incidence between men and women are almost equal.	
	2. Factors which can be controlled	

Objective	Course Content	Activities
	a. Obesity-with increased pounds, the heart has an increased workload to supply this area with necessary O ₂ and nutrients.	Ask pts. how many pounds they have to lose to be at an average weight
	b. Arteriosclerosis-although this is a normal part of aging, high levels of cholesterol will lead to more deposits.	Ask pts. to give examples of foods high in cholesterol.
	c. High blood pressure-prolonged constriction of the arteries will increase the risk of attack.	
	d. Smoking-leads to prolonged constriction of the coronary arteries.	Ask how many people smoked prior to their admission. Death rates range from
	e. Lack of exerciser-studies show that men who lead sedentary lives run a higher risk of heart attack than those who get regular exercise. Exercise tones the muscles, stimulates the circulation, and helps to avoid overweight.	50-200% higher among cigarette smokers than among non-smokers.
	f. Diabetes-the body does not	

Objective

Course Content

Activities

produce enough insulin to turn sugar and starch into energy. As a result, excess sugar builds up in the blood. This is associated with a rise in cholesterol and other fats in the blood, and with the development of arteriosclerosis.

- g. Stress-leads to constriction of the coronary arteries. Talk with pts. concerning what makes them anxious. What types of jobs do these people have.

V. Rehabilitation after a heart attack

A. Definition of Rehabilitation

To discuss the importance of exercise after a heart attack and to give examples of appropriate types of activity

1. Gradual return to activities of daily living. Have pt. look at activity booklet made up by St. Francis
2. Represents stage of recovery.

B. Stress the fact that each person is an individual and that he should ask his physician when the best time is to return to full function.

C. Institute of program of increased exercise and activity for long-term rehabilitation.

1. Begin physical conditioning with a gradual increase of activity levels. This has been started in the hospital prior to discharge.
2. Plan a daily program of exercise that will

Objective

Course Content

Activities

become a permanent part of your life.

3. Types of activities which are acceptable for a heart pt.

a. Pt. may carry out self-care and routine daily activities in the house, including climbing a few stairs and light housework.

b. Walking should be encouraged so that at the end of the second week at home, the pt. can walk comfortably one mile a day.

c. Quiet activities are suggested during the first weeks at home. These include:

1. Card playing	Ask previous MI pts. what activities they did when they first got home.
2. Games	
3. Hobbies, recreations	

d. Sexual activities may be resumed with the consent of your doctor usually within three weeks of your discharge from the hospital.

e. Driving the car is also up to the discretion of your doctor. Usually, driving privileges are restored within one month of discharge.

f. Importance of not tiring yourself out --May be managed by daily naps, taking six small meals instead of the usual three, appropriate

Objective

Course Content

Activities

- activities,
avoiding stress-
ful situations,
becoming aware
of what makes
you tired and/
or uncomfortable.
- g. Avoid the follow-
ing:
1. Strenuous act-
ivity such as
heavy lifting
and pulling
 2. Heavy meals
 3. Emotional
stresses
- h. Return to work--
This will depend
on the type of
job you have. Pt.
may return to the
job on his doctor's
advice. Suggest
that the pt. start
by working shorten-
ed hours and in-
creasing these
hours as tolerated.
- Ask pts.
what type
of jobs they
have and how
they will
adjust to
their limit-
ed activity.
- D. Briefly discuss the type
of activity in CCU and
why this was instituted.
1. The pt. in CCU is al-
lowed minimal activi-
ty in order for opti-
mum healing conditions
to take place. The pur-
pose of minimal acti-
vity is to decrease
the workload of the
heart and allow the
collateral circula-
tion to revitalize
the damaged area.
 - a. Bedrest
 - b. Cutting up of food.
 - c. Use of O₂ after meals.
 - d. Range of motion exer-
cises-passive exer-
cises to extremities.

Objective	Course Content	Activities
	<ul style="list-style-type: none"> e. Pulling pt. up in bed f. Use of bedpan g. No reading materials, initially h. Restricted visitors. 	
	<p>E. Briefly discuss the type of activity on 3M and why this was instituted.</p> <ul style="list-style-type: none"> 1. The pt. on 3M is gradually allowed increases in activity depending on the existence of complications such as pain, an increase in the number of irregular beats, and water retention. 2. Usual progression of activity: <ul style="list-style-type: none"> a. dangle-sitting at the side of the bed b. up in chair 2 or 3 times a day as tolerated, may also use commode at this time c. Up to the Bathroom d. Up in the Room and BRP e. Up and about 	

APPROVAL SHEET

The dissertation submitted by Lynn Dee Feldman Whitehead has been read and approved by the following committee:

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Associate Professor, Educational Psychology, Loyola

Dr. Jack Kavanagh
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The final copies have been examined by the director of the dissertation and signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May 22, 1978
Date

Joy Rogers
Director's Signature